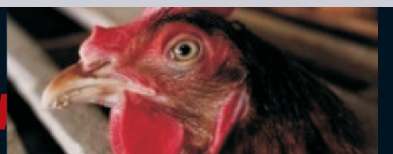


Analytical Techniques in Animal Nutrition Research

***T.M. PRABHU
K. CHANDRAPAL SINGH***



ANALYTICAL TECHNIQUES IN ANIMAL NUTRITION RESEARCH

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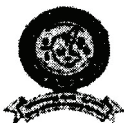
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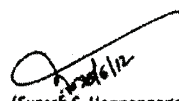
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Foreword

I am very happy to go through the Laboratory Manual on “Analytical Techniques in Animal Nutrition Research” prepared by Dr. Prabhu, T.M., Associate Professor & Head, Dept. Animal Nutrition, Veterinary College, KVAFSU, Hassan and Dr. Chandrapal Singh, K., Professor & Head, Dept. Animal Nutrition, Veterinary College, KVAFSU, Bengaluru, Karnataka. The topics covered in the manual ranged from commonly used routine analytical procedures in Animal Nutrition laboratories to the latest techniques required for specialized studies with ruminants.

The rich experience in teaching and research facilitated the faculty to prepare the topics for easy adaptation by post-graduate scholars of Animal Nutrition and other related disciplines from Veterinary / Agricultural Universities and Research Institutes of India and other developing countries. This may also be helpful for use by the feed compounding industries.

It is my immense pleasure to recommend this laboratory manual for day-to-day use by scholars, teachers and research workers in the field of Animal Nutrition and related disciplines.


(Suresh S. Honnappagol)
Vice Chancellor
Karnataka Veterinary,
Animal and Fisheries Sciences
University, Bidar

PREFACE

The livestock industry is growing in a much accelerated rate to meet the increased quality protein demand of our ever increasing population. The cost of feeding the animals and birds comes to nearly 70-75% of the total production cost of animal produce. Hence, assessing the quality of raw materials and judicious use of these ingredients in the preparation of an economical and balanced feed is very important. Further, the quality of raw materials show wide variation in the nutrient content. In such a situation precise measurement of the nutrient content is not only an important factor but the time involvement is also very important.

In this manual efforts have been made to cover a wide range of topics including detergent system of feed analysis, *in vitro*, *in situ* and *in vivo* studies to evaluate feedstuffs for their nutritive worth. Analysis of rumen liquor for fraction of VFA's enzymatic activity of various metabolites and estimation of rumen fluid volume and its flow rate are covered in depth. It was followed by estimation of anti-nutritional / toxic factors in various un-conventional feeds using HPLC / Spectrophotometer, detail analysis of milk and body condition scoring for dairy cattle are included as assessment of these parameters are important in Ruminant Nutrition Research.

Laboratory techniques are subject to continuous modification and improvement and this collection will be no exception. All the methods which are described, have been in regular use and therefore may be relied upon to obtain positive results. Although, necessary practical work is included, the exhaustive details have been avoided, since the manual is primarily meant for postgraduate scholars, teachers, scientists and feed industry personnel use. It is possible that in spite of our best efforts this compilation has still some shortcomings and mistakes / faults. We respectfully look to our generous readers, fellow teachers and scientists to point to us any fault or omission that may have crept inadvertently.

An attempt has been made to incorporate into this manual a variety of important source materials that ordinarily can be found in many

different locations. There is no claim made for originality in the essential and basic subject matter, but approach to the demonstration and performing of various research methodologies, its manner of treatment and presentation is entirely based on our own experiences.

We wish to place on record our indebtedness to Prof. Suresh, S. Honnappagol, the Vice-Chancellor, Dr. S. Yathiraj, Dr. M. S. Vasanth, Dean and Dr. U. Krishnamoorthy, Head, Division of Animal Science, KVAFSU, Bidar for their encouragement. The assistance and support of the publisher is most gratefully acknowledged.

2012

Prabhu, T.M.
Chandrapal Singh, K.

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Necessary practical work is included; the exhaustive details have been avoided, since the manual is primarily meant for postgraduate scholars, teachers, scientists and feed industry personnel use.

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Chapters at a glance

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- *IN SITU* DACRON BAG STUDIES
- NITROGEN FRACTIONATION BY CHEMICAL AND *IN VITRO* METHODS
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